$$\frac{a^2-8a+16}{a^2-16} = \frac{(a-4)^{\cancel{2}}}{\cancel{(a-4)}(a+4)} = \underline{\underline{\frac{a-4}{a+4}}}$$

Todella $a^2-8a+16=0 \iff a = \frac{8 \pm \sqrt{(-8)^2-4\cdot 1\cdot 16}}{2} = \frac{8\pm 0}{2} = 4$

$$a^2-8a+16 = (a-4)(a-4)$$

Nimen $a^2-16=0 \quad a^2=16 \iff a=\pm\sqrt{16} \iff a = \begin{cases} 4 \\ -4 \end{cases}$

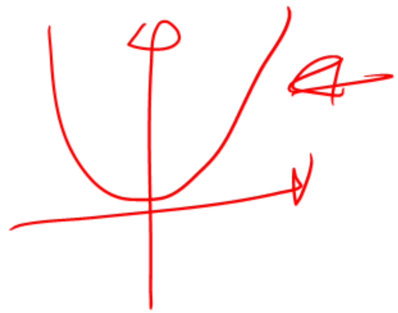
$$a^2-16=0 \quad a = \frac{-0\pm\sqrt{0^2-4\cdot 1\cdot(-16)}}{2} = \frac{\pm\sqrt{64}}{2} = \pm 4$$

$$a^2-16 = (a-4)(a-(-4)) = (a-4)(a+4)$$

$$\frac{2p^2 \cdot 4p}{6p \cdot 8p^2} \cdot 7p = \frac{\cancel{2 \cdot 4} \cdot 7 \cdot \cancel{p^2} \cdot \cancel{p} \cdot p}{6 \cdot \cancel{8} \cdot \cancel{p} \cdot \cancel{p^2}} = \frac{7}{6}p = \underline{\underline{\frac{7p}{6}}}$$

$$= \frac{7\,\cancel{56}\,\cancel{p^4}}{6\,\cancel{48}\,\cancel{p^3}} = \underline{\underline{\frac{7p}{6}}}$$

7.10.9 $\quad f^{-1}(x) = \sqrt[4]{x}$



7.10.10 a) $f^{-1}(x) = 5x-15$

b) $f(x) = 2x-3$

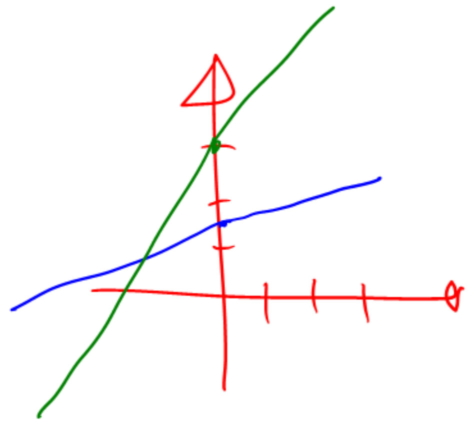
$y = 2x-3$ Opstil

$x = 2y-3$ Byt

$-2y = -x-3$ Løs

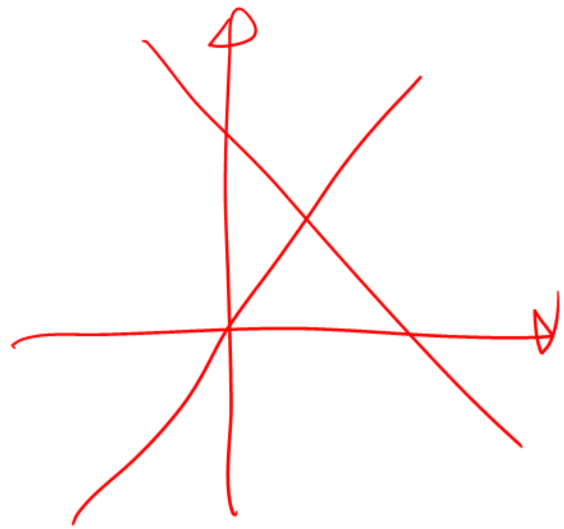
$2y = x+3$

$y = \frac{x}{2} + \frac{3}{2}$



$x+3$

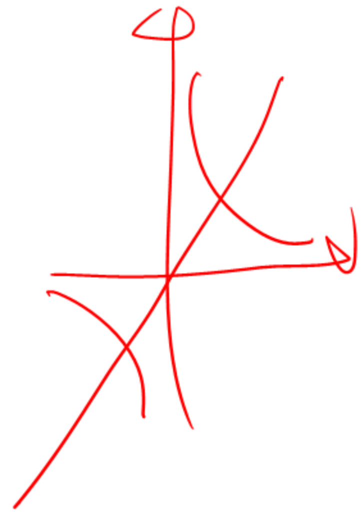
c) $f^{-1}(x) = -x + 4$



7.10.11 $\quad f^{-1}(x) = \dfrac{-4x-4}{2x-3}$

7.10.12 a) $\quad f^{-1}(x) = \sqrt[3]{x+3}$

b) $\quad f^{-1}(x) = \dfrac{1}{x}$



7.11.5

$f(x) = x^2 - 3$

$D_m f = \mathbb{R}$

$V_m f = [-3; \infty[$

$D = 0^2 - 4 \cdot 1 \cdot (-3) = 12$

$y_T = \frac{-D}{4A} = \frac{-12}{4 \cdot 1} = -3$

$g(x) = 2\sqrt{2x-6}$

$D_m g = [3; \infty[$

$V_m f = [0; \infty[$

$f \circ g = f(g(x)) =$

$(2\sqrt{2x-6})^2 - 3 =$

$4(2x-6) - 3$

$= 8x - 24 - 3$

$= 8x - 27$

$g \circ f = g(f(x)) = 2\sqrt{2(x^2-3)-6}$

$= 2\sqrt{2x^2-6-6} = 2\sqrt{2x^2-12}$

7.24 a) $f(x) = \sqrt{x-3} + 2$; $x \geq 3$

$Dm f = [3; \infty[$

$Dm f^{-1} = Vm f$

$Vm f = [2; \infty[$

$y = \sqrt{x-3} + 2$ Opstil

$x = \sqrt{y-3} + 2 \Leftrightarrow$ Byt

$-\sqrt{y-3} = -x + 2 \Leftrightarrow$ Løs

$\sqrt{y-3} = x - 2 \Leftrightarrow$

$(\sqrt{y-3})^2 = (x-2)^2 \Leftrightarrow$

$y - 3 = (x-2)^2 \Leftrightarrow$

$y = (x-2)^2 + 3 \Leftrightarrow f^{-1}(x) = (x-2)^2 + 3$

$Dm f^{-1} = [2; \infty[$

7.30 c

$$f(x) = x^4 - x^2 + 1$$

$$g(x) = \underline{x+1}$$

$$g(f(x)) = \underbrace{(x^4 - x^2 + 1)}_{f(x)} + 1 = \underline{\underline{x^4 - x^2 + 2}}$$

$$f(g(x)) = (x+1)^4 - (x+1)^2 + 1$$

$$(x^2 + 2x + 1)^2 - (x^2 + 2x + 1) + 1$$

$$(x^2 + 2x + 1)(x^2 + 2x + 1) - (x^2 + 2x + 1) + 1 =$$

$$(x^2)^2 + x^2 \cdot 2x + x^2 \cdot 1 + 2x \cdot x^2 + (2x)^2 + 2x \cdot 1 +$$

$$1 \cdot x^2 + 1 \cdot 2x + 1 \cdot 1 \; - x^2 - 2x \underbrace{-1+1} =$$

$$x^4 + 2x^3 + x^2 + 2x^3 + 4x^2 + 2x + x^2 + 2x + 1 - x^2$$

$$-2x - 1 + 1 =$$

$$x^4 + 4x^3 + 5x^2 + 2x + 1$$

7.32

$f(x) = \frac{1}{2}x + 3 \quad -4 \leq x < 6$

$g(x) = 5 - \frac{1}{3}x \quad 0 < x \leq 9$

$g \circ f(x) = g(f(x))$

$f(-4) = \frac{1}{2}(-4) + 3 = 1$

$f(6) = \frac{1}{2} \cdot 6 + 3 = 6$

$g \circ f(x) = 5 - \frac{1}{3}\left(\frac{1}{2}x + 3\right)$

$= 5 - \frac{1}{6}x - 1$

$= 4 - \frac{1}{6}x$

$\mathrm{Im}(f) = [1; 6[$

$g(f(-4)) = 4 - \frac{1}{6}(-4) = 4 + \frac{2}{3} = 4\frac{2}{3}$

$$g(f(6)) = 4 - \frac{1}{6} \cdot 6 = 3$$

$$Im(g(f(x)) = \left]3 \,;\, 4\tfrac{2}{3}\right]$$